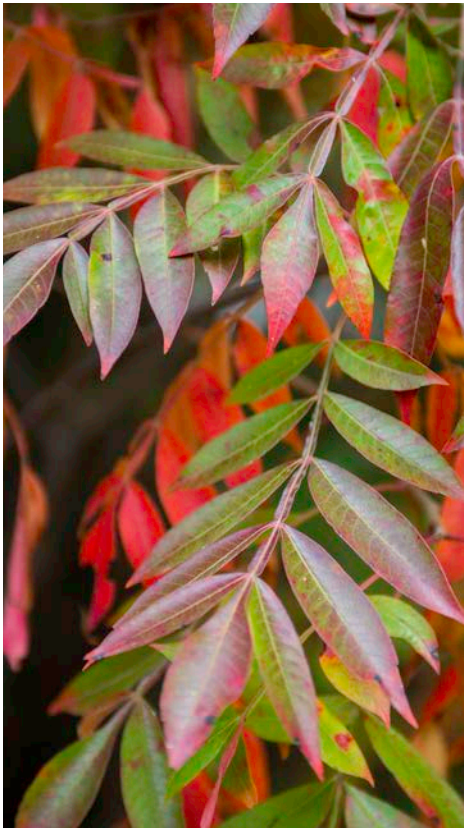




# Missouri Resources

Fall 2018 • Volume 35 • Number 4





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**ABOVE**  
**Sumac changes from green to red in early October at Mark Twain State Park.**  
MoDNR PHOTO BY BEN NICKELSON

**ON THE FRONT COVER**  
**Maple leaves scatter across 1,000<sup>th</sup> Mile Trail at Harry S Truman State Park. Opened in 2015, the trail marks the park system’s 1,000<sup>th</sup> mile of trail.**  
MoDNR PHOTO BY BEN NICKELSON

**ON THE BACK COVER**  
**A young Wonders of Wildlife (WOW) event participant learns archery at Roaring River State Park in Cassville.**  
MoDNR FILE PHOTO

CONNECT WITH MoDNR



CONNECT WITH MISSOURI STATE PARKS



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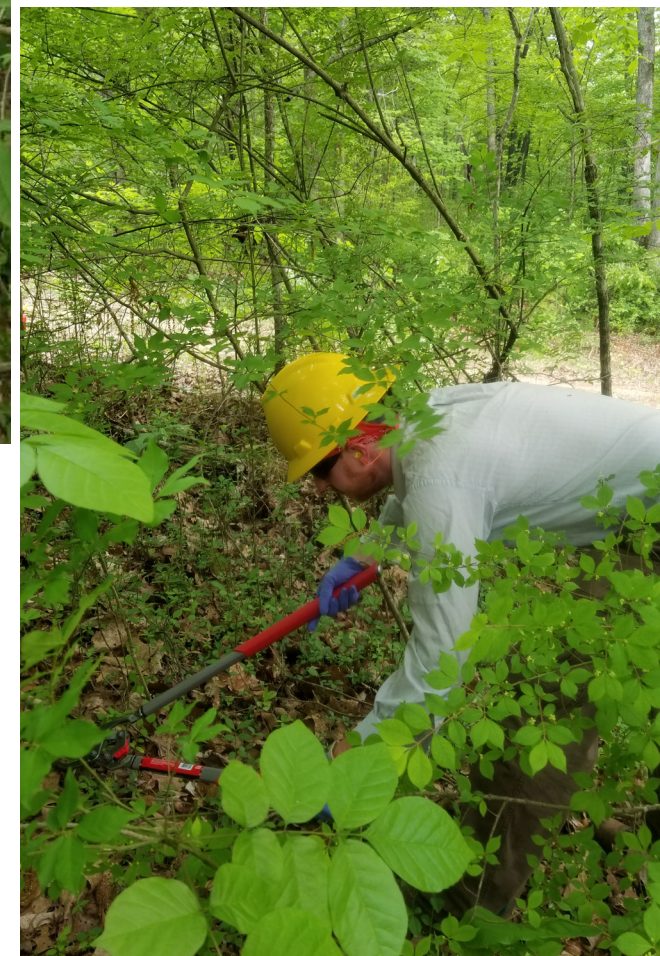
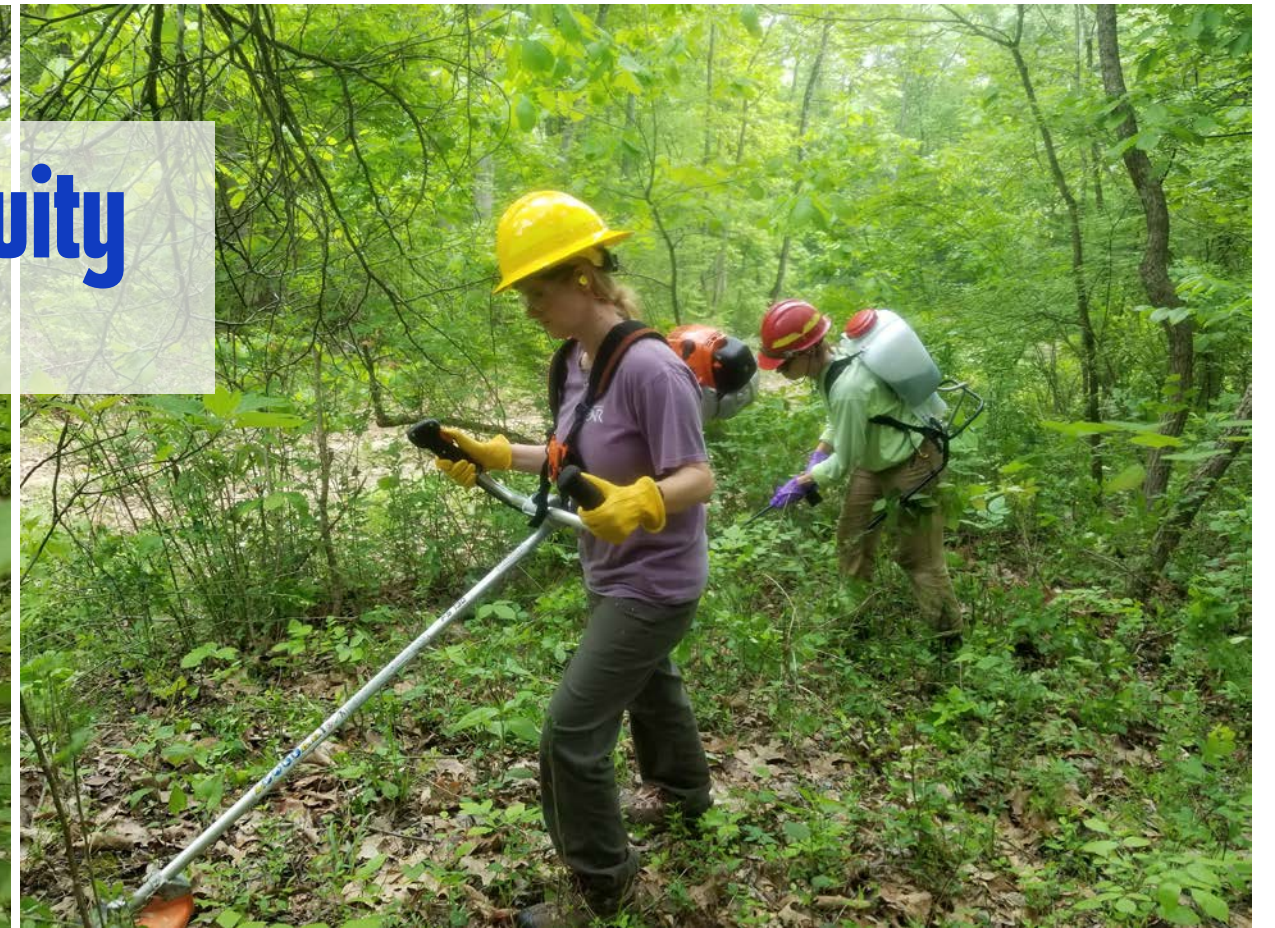
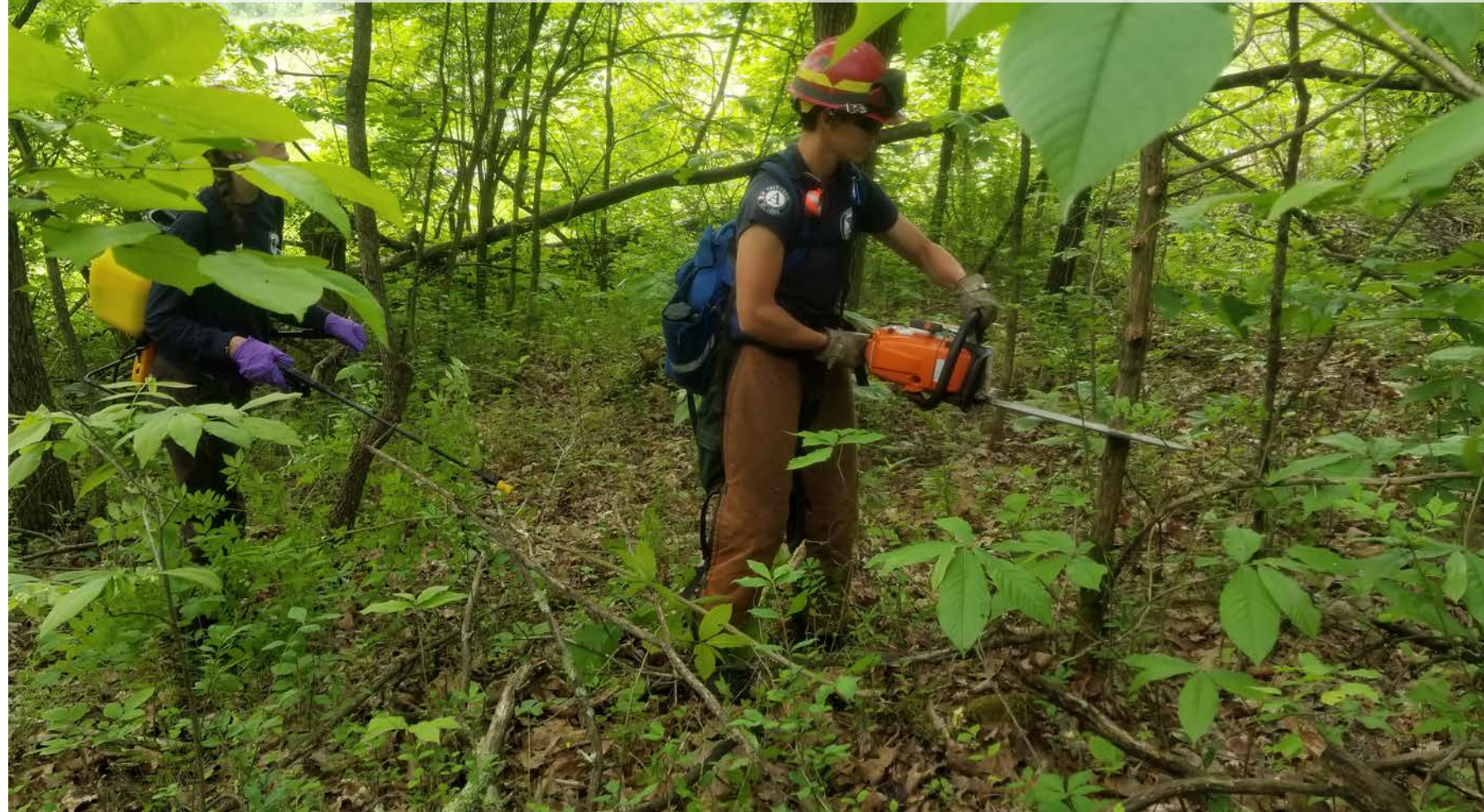
**ABOVE**  
**Mark Phillips’ cattle pond, on his family farm in northern Webster County, has endured 26 years without completely drying up – until the relentless drought of summer 2018.**  
PHOTO COURTESY MARK PHILLIPS / P BAR LAND & CATTLE



# Chain Saws, Brush Cutters and Sweat Equity

## Madison County Restoration Project, Part II

story and photographs by Amy Poos



(Far left) An AmeriCorps volunteer uses a chain saw to remove cedar trees, which are encroaching on the native hardwood vegetation.

(Above) Leslie Lueckenhoff, project manager, cuts exotic brush to make room for the native vegetation.

(Left) Crew members use lopping shears to cut and clear smaller brush.

Sometimes restoration efforts require a little destruction to be successful. And during a hot Missouri summer? Suffice to say, jackets not required.

To get any project completed successfully, cooperation, collaboration and teamwork are essential. The Missouri Department of Natural Resources recently partnered with the U.S. Fish and Wildlife Service, U.S. Geological Survey and AmeriCorps St. Louis for a weeklong effort to continue restoration efforts at the site of the former Little St. Francis River Mine Waste Pile in Madison County (See our Winter 2018 online feature story titled: *A Forest Rises in the Floodplains*, also authored by Amy Poos, which documents the initial project phase).

AmeriCorps St. Louis is part of a national service program made up of members who are dedicated to assisting with environmental stewardship projects and helping to manage and conserve natural resources.

The team met up back in Madison County to continue restoration work at the site where, just last winter, they planted 560 trees to convert a former mine waste pile back to a floodplain forest. This visit was a little different. The mission: To eradicate invasive species overtaking native plants in another part of the site, thus improving habitat quality. The list of invasive species targeted for removal included eastern red cedar, honeysuckle, burning bush and autumn olive.

## THE MISSION:

To **eradicate invasive species** overtaking native plants, e.g., eastern red cedar, honeysuckle, burning bush and autumn olive, **thus improving habitat quality.**



Our team went to battle equipped with chain saws, brush cutters, herbicide, and armored with hard hats and other personal protective equipment. Unlike last winter when there was rain and freezing temperatures, the team persisted in good ol' Missouri heat and humidity. Some of the team focused on cutting down honeysuckle, cedar trees and other species. Others applied herbicide to cut stems to ensure these invaders would not re-sprout. For the bigger cedars, sawyers made deep cuts around the trunks, a technique called girdling. This effectively kills the tree but will leave it standing in place. The benefit of this technique is that it helps reduce the amount of fuel on the ground.

Fuel? Yes, fuel. The next step in the restoration plan for the site is to conduct a controlled burn that is tentatively scheduled for late winter 2019. The invasive species eradication and controlled burn will reduce smaller understory vegetation and allow more light to penetrate the tree canopy. What looks like destruction will actually help restore and improve native habitat at the site and provide higher quality habitat to benefit wildlife.

Score at the 7th inning stretch?: Restoration team – 2; Invasive species – 0.

As for the newly planted trees, they have adjusted to their new environment and are flourishing!

Amy Poos is the division information officer for Missouri State Parks.

(Above right) MoDNR and U.S. Fish and Wildlife employees show off a tree they planted in fall 2017 on the site of a former chat pile. (Right) The interagency restoration team poses on-site with the tools of their trade.



(Below) An AmeriCorps volunteer sprays herbicide on the stumps of exotic shrubs to prevent them from re-sprouting. (Below right) A larger cedar tree has been “girdled,” which is the practice of cutting deep rings around the trunk that allow the tree to die naturally. This practice reduces the amount of timber/fuel on the forest floor.



(Left) A black oak sapling soaks up sun on the site of the former chat pile.

560 trees planted  
chain saws • brush cutters  
herbicide • hard hats  
next?: controlled burn!





# REVITALIZING MISSOURI'S WATER RESOURCES PLAN

by Jennifer Hoggatt

**M**issouri's Water Resources Plan helps our residents, visitors, and vibrant industries plan for their water needs now and into the future. Missouri's thousands of miles of rivers, streams, lakes and underground aquifers supply us with water to drink and plentiful outdoor recreation opportunities. They also are the lifeblood to support industry and agriculture.

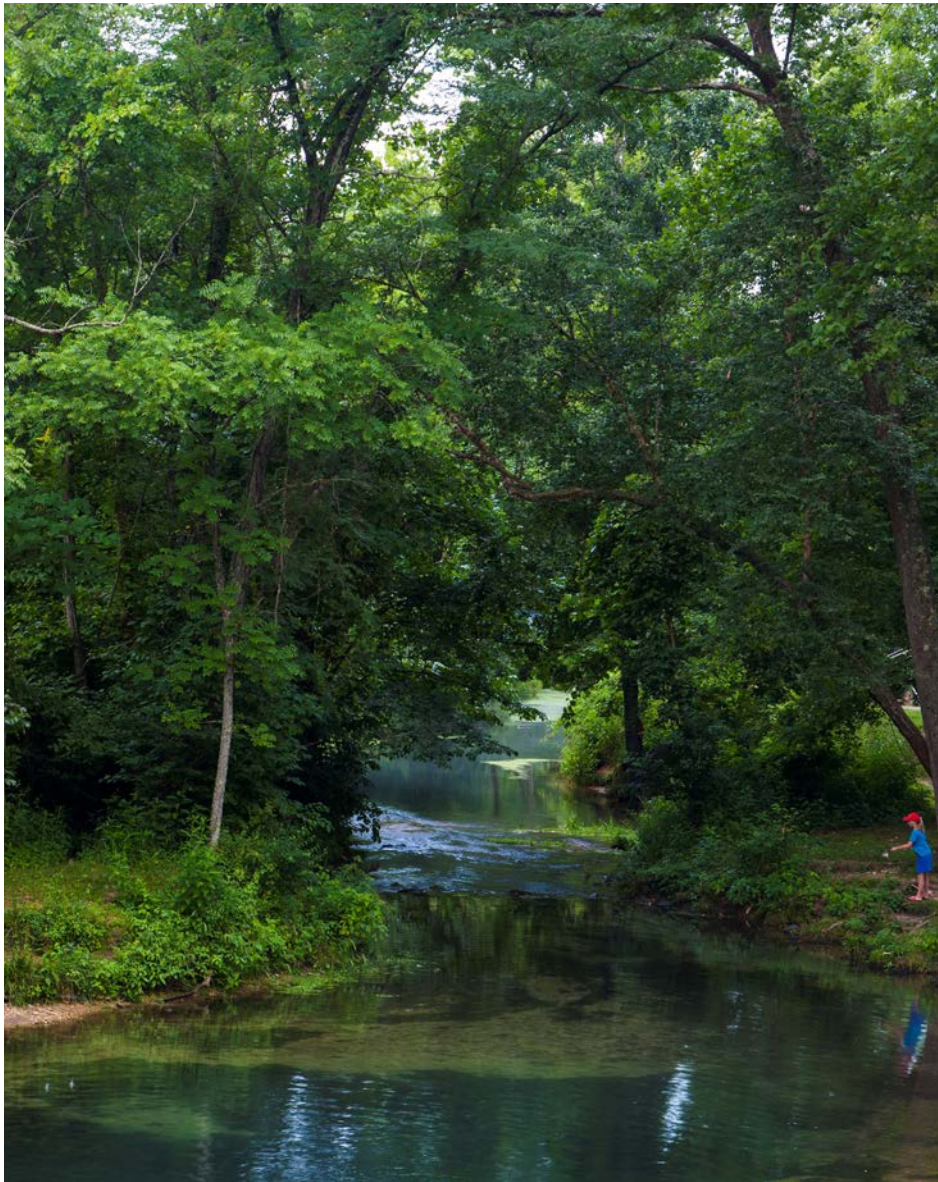
Understanding and planning for our natural resources is nothing new.

**(Background and below) Water is a critical and sustaining natural resource for Missouri agriculture and industry.**

MoDNR FILE PHOTOS







MoDNR FILE PHOTO

“Missourians have appreciated the value in collecting and distributing information about our natural resources for over 160 years,” said Joe Gillman, Director of the Missouri Geological Survey, a division of the Department of Natural Resources. “Using that information to create a state water plan began 80 years ago, with the first state water plan published in 1938.”

The department is updating the Missouri Water Resources Plan as directed by state statute. The current planning horizon is to look forward 40 years, through 2060. Goals of the plan are to:

- Develop a current evaluation of statewide supply, both surface and groundwater.
- Produce an in-depth analysis of demands by sector. Sectors include drinking water supplies, agriculture, industry, recreation, and navigation, among others.
- Identify gaps where supplies may not meet demands.
- Identify needs for infrastructure and evaluate funding and financing opportunities.
- Understand where integration of supply may be beneficial and look for innovative opportunities to solve supply challenges.

The department is engaging a wide range of stakeholders in updating the plan. There are two primary engagement outlets – the Interagency Task Force and Technical Workgroups. The Interagency Task Force acts as an advisory group, providing guidance and direction for the update. There are five Technical Workgroups: Consumptive Needs, Non-Consumptive Needs, Agricultural Needs, Infrastructure, and Water Quality. Workgroup members provide subject matter knowledge, give feedback throughout the development of the plan, and guide the methodology and analyses performed as part of the plan.

A lot of preparation, as well as employing respected partners, such as the University of Missouri, has assured stakeholders that their voices will be heard throughout the process.

“Agriculture provides the foundation of Missouri’s economy. The University brings key information, analysis and voices to a process that ensures that water resources continue to serve food producers and consumers statewide,” said Rob Kallenbach, Assistant Dean, College of Agriculture, Food and Natural Resources.

MoDNR FILE PHOTO



(Top) Many Missouri rivers and streams provide drinking water and habitat for a variety of fish and wildlife.  
(Right) Planning, especially during droughts, is vital to ensure a long-term, reliable water supply for citizens.

**“Using that [collection and distribution] information to create a state water plan began 80 years ago, with the first state water plan published in 1938.”**

– Joe Gillman, Director, Missouri Geological Survey



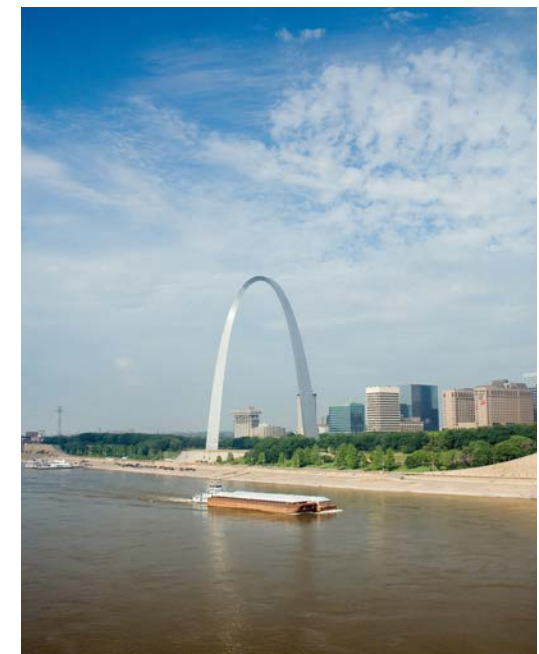
MoDNR PHOTO BY BEN NICKELSON

The updated Missouri Water Resources Plan is expected to be available in late 2019. Learn more online at [dnr.mo.gov/mowaterplan](http://dnr.mo.gov/mowaterplan).

*Jennifer Hoggatt is director of the department’s Water Resources Center.*

(Above) Residents and visitors to Missouri depend on the state’s water resources, with some of our most popular tourism and recreation spots centered around our rivers, streams and lakes.

(Right) A barge transports freight on the Mississippi River in front of the Gateway Arch in St. Louis. Freight navigation, an important Missouri industry, depends on adequate water flows in the Missouri and Mississippi rivers.



MoDNR FILE PHOTO



# PRESCRIBED BURNS IN MISSOURI STATE PARKS

by Madison Conte  
MoDNR file photos

Imagine you are hiking through Missouri's wilderness, trudging through miles of thick forest, each mile less distinguishable from the last, when you realize you've stepped into a different landscape. There is more light, more space between the trees and the breeze seems to flow more freely. The understory is lush and green, highlighted here and there by splashes of wildflowers, all abuzz with butterflies, bees and other wildlife.

You might not guess it at first glance, but if you look closely the signs are there. This tranquil oasis you've discovered is made possible by ... fire!

"Fire is the force that brings the diversity, the variety, the abundance of life to our prairies and glades, our forests and wetlands," Natural Resource Management Section Chief Ken McCarty said.

McCarty said fire hasn't always been recognized as a positive force in Missouri, much less a tool to properly maintain the natural landscape. In fact, the first prescribed burn in Missouri state parks wasn't conducted until 1976 at Cuivre River State Park.

Since then, the philosophy around prescribed burns has evolved. Of Missouri's 56 state parks, 51 now have established burn units. The department leads 60 to 120 burns each year, burning nearly 40,000 acres in three- to five-year cycles.

These fires, which burn primarily in early fall and spring, are a far cry from the unpredictability of

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**(Below) Prescribed fires in Missouri forests tend to be low ground fires that remove underbrush and leaf litter so wildflowers and woodland plants can thrive.**

A pine woodland at Hawn State Park, Ste. Genevieve County, preserved with regular prescribed fire since 1989, demonstrates the open grassy character of a fire-managed native forest.







wildfires. Prescribed burns usually employ two teams of four to six people to carry out techniques perfected by decades of observing and documenting fire behavior.

The two crews walk in opposite directions, lighting and snuffing out the perimeter until they meet at the opposite end of the fire, completing one big circle. The fires are set up so that they burn into the middle of the circle and ultimately burn themselves out. This clears the ground of leaf litter from previous years and leaves open soil to nurture the plants that grow during the following season.

“There’s a lot of satisfaction in accomplishing something so technically complex,” McCarty said, “but the real reward comes the following spring and summer and fall when ... you can see that abundance of wildflowers or wildlife. It’s something that, without fire, would phase out of existence.”

McCarty said prescribed burns and their aftermath provide “a very complex and amazing picture of Missouri’s natural environment,” falling perfectly in line with the mission of Missouri State Parks: to preserve natural landscapes for all Missourians to enjoy.

*Madison Conte was an intern for the Missouri Department of Natural Resources’ (MoDNR) Office of Communications during summer 2018. John Nichols is an environmental specialist with the department’s Hazardous Waste Program.*



(Top) State parks prescribed fires are carefully set and managed to preserve park landscapes and benefit their native flora and fauna.

(Above) Controlled burns allow park staff to control which areas of the park are burned. In this photo, only one side of the trail needed to be burned.

(Right) State parks staff start a controlled burn with drip torches.



## PREScribed BURNS — OTHER APPLICATIONS

by John Nichols

The Department of Natural Resources and the U.S. Fish and Wildlife Service, serving as Missouri’s Natural Resource Trustees, partner with other groups to restore native habitat around some of the state’s historic lead mining districts across the state.

Fire is an integral process to maintaining prairies in their natural state. In southwest Missouri, the trustees are working with the Missouri Prairie Foundation to restore two prairie remnants near Diamond, in Newton County. Although these prairies have never been plowed, they have not experienced fire in decades.

In nearby Webb City, the trustees are working with the city to reconstruct prairie on more than 700 acres of former mine lands. Since

reintroducing fire to control eastern red cedar trees on remnant prairie fields surrounding the old mines, city staff have seen native prairie plants sprouting back to life. The restoration project area is divided up into small burn units which can be easily and safely managed. Many of the units are not far from residential neighborhoods, so the Webb City Fire Department is always on hand to assist. They provide an extra layer of precaution and create an opportunity for the firefighters to practice dealing with natural cover fires.

Prescribed fire also will be a component of restoration projects just getting started in the Old Lead Belt of southeast Missouri. There, fire will help control invasive plants in woodland areas and help promote the wildflowers and forbs that bloom on the forest floor.

(Top) Prescribed burns are successfully employed to clear the ground for native plantings and promote native prairie vegetation in various restoration areas across the state.



# Nautiloid

Nautiloids comprise about 10 distinct groups of shelled cephalopod marine mollusks that came into existence at different times between 500 and 470 million years ago during early Paleozoic time. They quickly reached their peak taxonomic (classification) diversity and peak population density between 460 and 430 million years ago. For the remaining 200 million years of Paleozoic time, and into the first 50 million years of Mesozoic time, they suffered a general decline characterized by the gradual episodic extinction of all but one taxonomic group – Nautilida – that survived, though in ever declining numbers, for the next 200 million years to present day.

About 2,500 species of nautiloids are known to have existed through geologic time. Only two genera (subdivisions) of nautiloids containing six (some claim only three) species exist today, and they inhabit the southwestern Pacific Ocean from the Philippines to Samoa and the eastern Indian Ocean off the west coast of Australia. Only the test of time will determine whether they eventually go extinct, too.

The shell of an infant nautiloid starts out as a simple cup in which soft body parts reside. The cup constitutes the first living chamber. As the infant body grows, the length and width of the shell keeps pace through the deposition of new shell material around the rim of the cup. Periodically, a thin septum of rigid shell material is deposited behind the body and completely across the inside of the shell. Repetition of this process during growth results in a sequence of empty chambers situated behind the body chamber. In this way a growing nautiloid maintains a living chamber of proper width and depth. As each septum is added, so is a tube of shell material and soft tissue that connects every new living chamber with the tube of the previous living chamber. The individual tubes collectively form a single siphuncle (long tube) that runs the length of the shell.

Since soft tissue is rarely preserved in the fossil record, most of what can be said about the soft parts of fossil nautiloids has been inferred from the nautiloids that live today. They possess two large eyes having small apertures and no lenses, numerous short cirri (tentacles), a beaked mouth that is equipped with radula (tiny ribbon of teeth) and tongue, a flexible hood that is employed for capping the living chamber in times of stress, and a hyponome that is a fleshy conduit for circulating seawater through an internal cavity that contains gills.

Nautiloid fossils are found in the limestone walls of the Capitol in Jefferson City. Visit the Capitol and check out the *Capitol Fossils* brochure online at [dnr.mo.gov/pubs/pub2488.pdf](http://dnr.mo.gov/pubs/pub2488.pdf).



MoDNR PHOTOS BY BEN NICKELSON

## Nautiloid

Most of what is known about ancient nautiloids is from the fossilized, rigid, one-piece, external, calcium carbonate shells they left behind when they died. Every nautiloid has a shell that is shaped in a way that is diagnostic for its particular species.

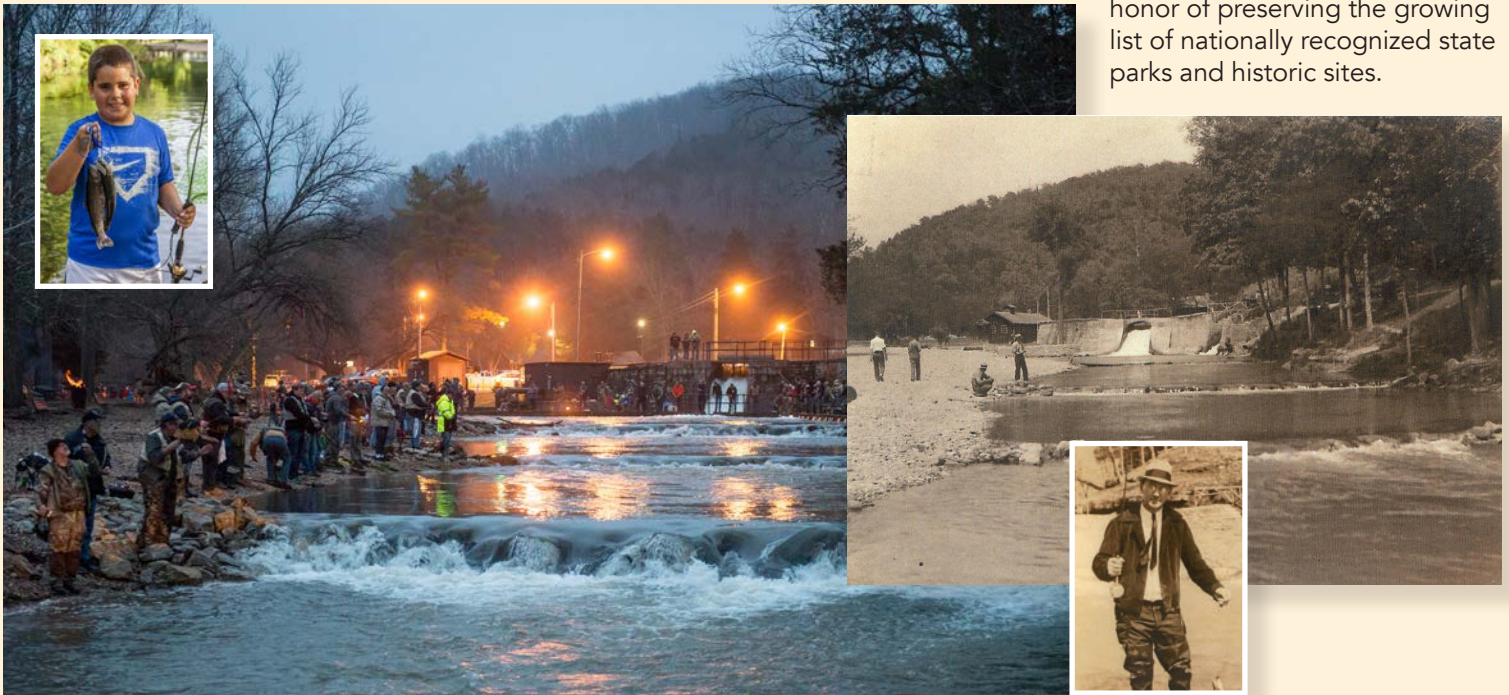
**(Top) Slightly convolute (coiled) nautiloid *Metacoceras angulatum* from Carboniferous, Pennsylvanian, Kansas City Group, Winterset Limestone Member of Dennis Formation just southwest of Lee's Summit in Jackson County, Missouri. The shell is 3.75 inches across from left to right. External shell material is missing, having adhered preferentially to the surrounding rock matrix when the specimen was cracked out of a large rock. Consequently, the living chamber and septa are readily discernable. These and other fossils are on public display at the Missouri Geological Survey, 111 Fairgrounds Road in Rolla.**

**(Above) Gyrocone nautiloid *Vestinautilus digonum magnum* from Carboniferous, Mississippian, Chouteau Group, Compton Limestone near Otterville, in Cooper County, Missouri. The straight-sawed bottom edge of rock matrix is 3.75 inches across.**

## Roaring River State Park Opened in 1928 – 90 Years Ago!

Roaring River State Park is truly unique on many levels. Despite the rugged nature of its 3,733-acre landscape, settlers were drawn to the area in the early 1800s for its beauty and the clear reliable streams that powered their mills. But the area was not always peaceful. The hills around Roaring River served as hideouts for Civil War guerrillas and outlaws, and large-scale troop movements traveled the countryside.

After the war, the valley became known as a resort community with cottages dotting the hillsides. Dr. Thomas Sayman, a wealthy businessman from St. Louis, purchased 2,400 acres of land surrounding Roaring River Spring, turned it over to the state and in 1928, Roaring River State Park was born. The Missouri State Parks Fund, established in 1917 by the Missouri State Legislature, was responsible for operating and maintaining the new gift. The Missouri Department of Natural Resources was created in 1974 and assumed the honor of preserving the growing list of nationally recognized state parks and historic sites.



MoDNR PHOTO BY ANDREW RICHMOND / INSET PHOTO BY BEN NICKELSON

MoDNR FILE PHOTOS

## In 1928 ...

To get a feel for 90 years ago, here are some tidbits from 1928 with connections to Missouri: Charles Lindbergh was presented the Medal of Honor by President Calvin Coolidge, for his first trans-Atlantic airplane flight the previous year (flying the *Spirit of St. Louis*); The first machine-sliced and machine-wrapped loaves of bread were sold in Chillicothe; Mickey Mouse (created by Walt Disney, born in Marceline) appears in *Steamboat Willie*, the third Mickey Mouse cartoon released, but the first sound film. The St. Louis Cardinals appeared in their second World Series and lost to the Yankees.

## About the Park

Roaring River State Park is one of Missouri's most popular state parks. Located in the southwest Ozark hills, it is one of three state parks stocked with rainbow trout and offers many options for campers. The campground has basic, electric and sewer/electric/water sites. Rustic cabins are scattered throughout the park or guests may choose a modern room at the Emory Melton Inn and Conference Center. The character of the park today is influenced not only by the landscape but also by the hands of Civilian Conservation Corps and Works

Progress Administration workers who helped develop the park in the 1930s. The CCC and WPA built structures such as picnic shelters, the fish hatchery, trails and cabins, many of which are still in use. A bronze statue of a CCC worker stands in the park today, a tribute to their contributions.

Over thousands of years, natural erosion created an abrupt change in the landscape, from the flat plains of the plateau to deep valleys and steep hills. Visitors driving to the park enjoy the last mile of the drive into the valley, which drops 400 feet in elevation. Roaring River State Park is home to more than 600 species of plants and 205 species of birds. The most striking natural feature of the park is Roaring River Spring. Each day, more than 20 million gallons of clear, 57-degree water flow from the spring into Roaring River. The 2,075-acre Roaring River Hills Wild Area preserves this wilderness quality and offers rugged Ozark terrain, dense hardwood woodlands, open dolomite glades and deep hollows.

Roaring River State Park is located 7 miles south of Cassville on Highway 112 in Barry County.



# Sieu Dang

**Environmental Engineer,**  
Missouri Department of Natural Resources,  
Southwest Regional Office



**Please introduce yourself and tell us how long you’ve been working for the Department of Natural Resources.**

Hi, my name is Sieu Dang and I work as an environmental engineer with the Missouri Department of Natural Resources’ Southwest Regional Office in Springfield. I have been with the department for over 11 years. Since I started, I have learned to enjoy the outdoors more, and I’m a better person and professional because of this learning.

**Explain where you work and describe your job duties.**

Well, you know, since I joined the department, I oversee 25 beautiful counties in the southwest region of the state. Our regional office has an air pollution control program, water protection programs, solid waste management and hazardous waste program. I work under the water protection program and as an environmental engineer, my job is to assist the public by providing technical assistance to regulated communities, including municipalities, industries and other public entities. I review engineering plans, specifications and reports to make sure documents meet the department’s design standards. I also conduct inspections, including construction inspections on the



(Above; top right) Dang takes a water sample and displays some of the tools of the trade.  
MoDNR PHOTOS BY ANDREW RICHMOND

wastewater treatment facilities. I also do compliance inspections to ensure the regulated communities are in compliance with the rules and regulations of the permits. Sometimes I do investigations and water quality monitoring, including sampling, to make sure the surface waters are meeting our water quality standards. On a daily basis, I review files of engineering documents and make phone calls and inspections. I also go out and make site inspections at the region’s newest water treatment facilities and provide technical assistance as needed.

**What do you like most about working at MoDNR?**

I like the people – we have a group of experts that includes scientists, engineers, environmental specialists and other professionals. They are committed to protect our natural resources, and very willing to help.

**How do you feel that your job helps to enhance Missouri’s natural resources?**

I think our Missouri clean water rules, regulations and design standards, are created to protect and enhance the environment. So by helping the public and regulated communities understand, maintain and achieve compliance with the rules and regulations, we, in turn, protect and enhance the state’s natural resources.

**What would you tell someone considering a career with MoDNR?**

We are committed to the department’s mission. If you enjoy the outdoors and appreciate nature, you know it’s a place for you. Or if you just want to grow professionally, we have experts to help you to achieve that goal. So you know it’s one of the rare jobs that, at the end of the day, you feel good about yourself. We have many different environmental programs, so anything related to environmental protection, we probably, in one way or another, have our hands in it. So I think it’s a great place to work, a great way to learn, and a great place to hang out because we work at as team – we have one common goal – protect and enhance our natural resources.

Go to [dnr.mo.gov/hr](http://dnr.mo.gov/hr) and join a great team, start a great career and achieve a great purpose.

# CABINS FOR CANINES

by Brian Quinn  
photographs by Ben Nickelson

**H**ave you ever taken your family on a camping trip, but the experience wasn’t as fun because the family dog couldn’t go with you? Or have you felt guilty when leaving your canine friend at a boarding kennel on your way to a fun, relaxing week in a peaceful cabin? If so, you may be looking for places you can take family camping outings or personal vacations and still be able to include your furry family member.

Missouri State Parks wants you to know your pets are welcome at any of our campsites and our *Cabins for Canines* program welcomes your dog in lodging units at 14 of our state parks across the state. In fact, about 30 percent of our lodging units are available to visitors with dogs. Of course, service animals qualifying under ADA requirements are permitted in all facilities.

Our *Cabins for Canines* program includes outpost cabins, camper cabins, yurts, single-unit cabins, as well as four-plex and duplex units. Appropriately sized courtesy crates or kennels are provided for each unit. There is a per-dog, per-night fee, which varies depending on the type of lodging unit chosen.



(Above) A boxer wades in the cool waters of the Current River while on a float trip near Current River State Park in Shannon County.  
(Left) A boxer camps with its family at Lake Wappapello State Park, in Williamsville, Wayne County.





Hikers at Hawn State Park keep their Shetland sheepdog leashed and on the trail.

TOP 10 WAYS TO ENJOY VISITING A MISSOURI STATE PARK WITH YOUR PET

If you’ve never brought your pet to a Missouri state park, here are 10 ways you can make your visit enjoyable for you, your pet and for folks around you.

- 🐾 Appreciate the natural and cultural resources of the park. Keep your pet from digging in any area of the park or historic site, and out of any buildings.
- 🐾 Enjoy your pet’s company, but remember that not everyone is comfortable around them. Always keep your pet leashed and under control.
- 🐾 Enjoy water recreation with your pet, but keep it away from swimming areas and beaches.
- 🐾 Keep your pet with you. Leaving it unattended is no fun for the pet or nearby visitors.
- 🐾 Make sure your pet always has plenty of water and food.
- 🐾 Leave no waste behind. Bring your own bags to pick up your pet’s waste. Ask about waste bag dispensers and trash dumpsters.
- 🐾 Respect the natural habitat of wildlife by keeping your pet at a safe distance.
- 🐾 Enjoy all the benefits of the outdoors and allow others to do the same by keeping pet noise to a minimum.
- 🐾 Follow all rules as posted. This will leave a positive impression for all pet owners and ensure the privilege continues.
- 🐾 Respect and enjoy Missouri’s state parks and historic sites.

For more information, including rules and a list of *Cabins for Canines* locations, go to [mostateparks.com](http://mostateparks.com).

*Brian Quinn is the division information officer for the department’s Division of Environmental Quality.*



(Far left) A Siberian husky relaxes with its owner early in the morning at Finger Lakes State Park, near Columbia in Boone County.  
(Middle left) After arriving at Watkins Woolen Mill State Park campground in Lawson, Clay County, a park guest and dachshund stretch their legs.  
(Left) Coming prepared with bags, a park guest at Watkins Woolen Mill State Park cleans up after his Labrador puppy.





# Top Spots for Fall Color



It's almost that time. The signs are beginning to appear – if only barely. The sun has begun setting a few minutes earlier each day, the air is just starting to change, and the acorns, walnuts and hickory nuts are starting to drop. Fall in Missouri, the most popular season for many, is almost here! And you know what that means – the trees will soon burst forth in a magnificent display of reds, yellows, oranges and golds in virtually limitless shades.

With fall just around the corner, it's not too early to begin planning weekend road trips to take in Missouri's legendary autumn colors that are sure to be on glorious display across ridgelines, along soon-to-be harvested fields and flowing beside rivers and streams through their misty valleys. As you begin mapping out routes and considering destinations, you would be remiss if you didn't include Missouri State Parks on your travel itinerary. Our state parks are home to some of Missouri's oldest, most pristine forests, which means they also are prime spots to view some of the most beautiful fall colors around. To help you decide which state park to choose, may we recommend three?

**Trail of Tears State Park** has shaded picnic sites, hiking and horse trails, and majestic views of the Mississippi River

and beyond. Along with gorgeous fall colors, the park's location right on the river makes it one of the best places in Missouri for viewing migratory waterfowl. The park borders the Mississippi River and is located 10 miles east of Fruitland off Highway 61, taking Highway 177 East, in Cape Girardeau County.

**Mark Twain State Park's** rugged terrain is covered by bluffs overlooking the 18,000-acre lake. As you walk along the trails in the forest, you are surrounded by a sea of rich fall color. The area is filled with white-tailed deer, turkey and other wildlife. The park is near Florida, home of Mark Twain's Birthplace State Historic Site, on Highway 107 in Monroe County.

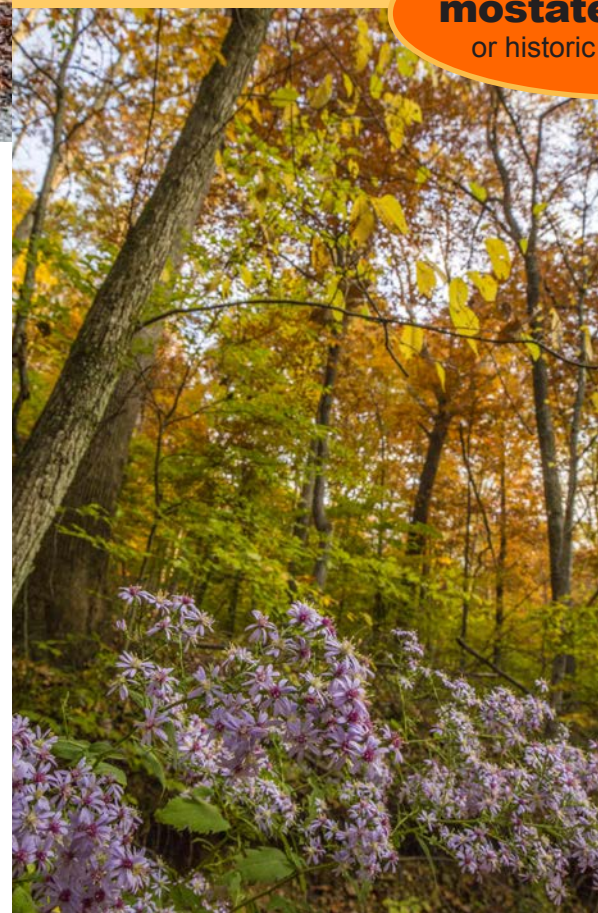
**Katy Trail State Park** winds through 240 miles of some of Missouri's most scenic areas with most of the trail closely following the Missouri River. The park also features a slice of rural history as it meanders through the small towns that once thrived along the railroad corridor and still reflect our state's rich heritage.

Visit [mostateparks.com](http://mostateparks.com) for more details.



A grove of colorful trees reflects across the waters of Tom Sawyer Lake at Mark Twain State Park in Monroe County.

to find a state park  
**[mostateparks.com](http://mostateparks.com)**  
or historic site near you ...



(Top left) The camper cabins at Mark Twain State Park are nestled between trees that put on a spectacular show of colors in the fall.  
(Left) Aromatic aster blooms in the fall along Sheppard Point Trail at Trail of Tears State Park near Cape Girardeau.  
(Above) Cyclists enjoy a late October ride to take in the fall colors at Katy Trail State Park near Jefferson City.

MoDNR PHOTOS BY BEN NICKELSON



# Scour Trail

at Johnson's Shut-Ins State Park



At the overlook on Scour Trail, hikers can view the Taum Sauk Reservoir in the distance and the scour channel left behind from the 2005 breach.

MoDNR FILE PHOTO

In 2005, the Upper Taum Sauk Reservoir breached, sending 1.3 billion gallons of water cascading down the mountain and through the park. Everything in its path was stripped from the mountainside, leaving a 1.5-mile stretch without trees, flowers or soil.



MoDNR PHOTO BY BEN NICKELSON



MoDNR PHOTO BY BEN NICKELSON



MoDNR FILE PHOTO

(Above left) The trail passes through areas of rock rubble that collect pools of rainwater.

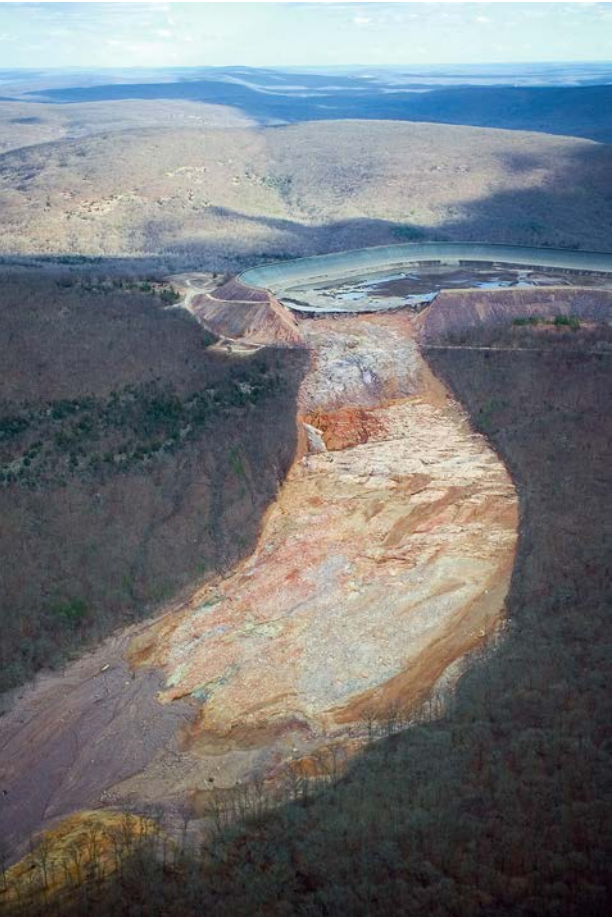
(Above right) The Scour Trail, blazed in red, connects and shares a path with the Taum Sauk section of the Ozark trail, blazed with a green and white “OT” logo.

(Left) The scour displays a range of geologic features that were exposed by the powerful breach of Taum Sauk Reservoir.

Scour Trail leads visitors to this scour channel. Stop at the interpretive pavilion and the upper overlook to learn more about the newly-exposed, 1.4 billion-year-old geology of the scour. Take time to walk into the scour itself along a spur trail, which takes you near some of the many geologic features of the ancient St. Francois Mountains.

This rugged, two-mile trail involves some uphill climbing on natural, rocky tread. Hikers may encounter water crossings. This trail also connects with the Taum Sauk Section of the Ozark Trail, which is 13 miles to the next trailhead. Parking for the Scour Trail's 2-hour hike can be found just north of the park's main entrance.

Johnson's Shut-Ins State Park is located 8 miles north of Lesterville on County Road N in Reynolds County.



MoDNR FILE PHOTO

(Left) An aerial view shows the stripped mountainside immediately after the 2005 breach of the Taum Sauk Reservoir.





# Funding Forums:

Agencies that fund water infrastructure projects take the show on the road

by Hannah Humphrey

Community leaders worried about how to pay for drinking water and sewer infrastructure had the chance to visit with agencies that offer solutions this summer as the Missouri Department of Natural Resources and two other agencies took to the road. MoDNR hosted workshops on funding opportunities for drinking water systems and wastewater treatment plants in Poplar Bluff, Lee's Summit, Clinton, Macon, West Plains, Eureka, Springfield and Jefferson City.

Out of sight and so often out of mind, water and sewer infrastructure are some of the most expensive assets owned and operated by a city or town, and have a major impact on the community's health, economy and overall well-being.

Mayor Bob Lourwood of Ironton attended the workshop in Poplar Bluff, and noted that MoDNR recently approved Ironton's plan to upgrade its wastewater treatment facility; he said the workshop organizers had perfect timing.

"Whenever necessary, we upgrade our infrastructure to meet the ever-changing demands," Lourwood said. "Paying for those upgrades is difficult for a small city, such as Ironton, so it is important for us to know what financing resources are available."

The department's Financial Assistance Center along with the Missouri Department of Economic Development (DED) and the U.S. Department of Agriculture-Rural De-

velopment (USDA-RD) provided information on financial assistance opportunities. These range from development of a plan to financing construction of multimillion dollar systems. DED offers grants, while both MoDNR and USDA-RD offer loans and grants for drinking water and wastewater projects.

Presentations were followed by an open house that offered participants the chance to connect with agency staff ready and willing to help them begin work on a water infrastructure solution.

To access agendas for the workshops, see the presentations or get more information, go to [dnr.mo.gov/env/wpp/srf/fac-marketing-workshops.htm](http://dnr.mo.gov/env/wpp/srf/fac-marketing-workshops.htm).

(Top left and top center) Community leaders and department staff gathered in Lee's Summit to discuss funding opportunities for drinking water and wastewater treatment systems. Pictured at top left is Mark Simmons of the USDA-Rural Development addressing the Lee's Summit attendees.  
MoDNR PHOTOS BY LEIGH MITCHELL  
(Top right) Joan Doerhoff, an environmental supervisor with MoDNR's Financial Assistance Center, gives a presentation on State Revolving Fund (SRF) loan programs to community members in Clinton.  
(Above right; right) Department staff answered questions and handed out information and forms after presentations in Poplar Bluff and Eureka.

"We know that state and federal assistance programs have a reputation for being slow and burdensome. Yes, there are hurdles, but we want communities to know our staff are here to help you get over the hurdles. Communities that work with us save money, and helping you get those savings is our job."  
— Hannah Humphrey, Director, Missouri Department of Natural Resources Financial Assistance Center



Hannah Humphrey

MoDNR PHOTO BY LEIGH MITCHELL



MoDNR PHOTO



MoDNR PHOTO



MoDNR PHOTO





## 2018 WOW

### National Outdoor Recreation and Conservation Schools

Wonders of Wildlife (WOW) National Outdoor Recreation and Conservation Schools are weekend programs designed to teach families how to enjoy a wide range of outdoor recreation activities while practicing personal safety and outdoor responsibility. Four schools are taught annually across Missouri.

- Kansas City Sept. 21-22
- Roaring River State Park Oct. 5-7
- St. Louis Oct. 6-7
- Springfield Information to come.



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